OXFORD JOURNALS
OXFORD UNIVERSITY PRESS

The Past and Present Society

Oral Contraceptives and Early-Term Abortifacients during Classical Antiquity and the Middle Ages
Author(s): John M. Riddle
Source: *Past & Present*, No. 132 (Aug., 1991), pp. 3-32
Published by: Oxford University Press on behalf of The Past and Present Society
Stable URL: http://www.jstor.org/stable/650819
Accessed: 28/07/2013 08:12

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at
http://www.jstor.org/page/info/about/policies/terms.jsp

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.

Oxford University Press and *The Past and Present Society* are collaborating with JSTOR to digitize, preserve and extend access to *Past &Present.*

http://www.jstor.org

ORAL CONTRACEPTIVES AND EARLY-TERM ABORTIFACIENTS DURING CLASSICAL ANTIQUITY AND THE MIDDLE AGES*

It is generally agreed that oral contraceptives are a product of the second half of the twentieth century and that early-term abortifacients are an even more recent discovery, still in the process of development. This article presents evidence that, contrary to this consensus, pre-modern (like present-day) traditional medical systems employed chemical means of birth-control and — although the evidence for this is less conclusive — that such chemical substances were substantially effective in controlling the birth-rate.

The accepted account of the history of birth-control rests on a particular understanding (sometimes misunderstanding) of what science says is possible. In this article, ancient sources which discuss birth-control (mostly medical) will be interwoven with modern reports from laboratory, clinical and other scientific studies of anti-fertility agents. The article also draws on medieval and early modern sources for the light they can shed on the historical use of some pharmaceutical agents. From this combination of historical and scientific data, it is difficult to avoid the conclusion that the historical records are reliable rather than misleading in suggesting that our female ancestors had some control over their reproductive processes.

It is widely acknowledged that, since at least the second century B.C., populations in the West have been deliberately limiting their rates of growth and, at times, slowing them to below replacement rates. It is thought that this has been achieved through means such as celibacy and sexual restraint, delayed marriages,

---

* The research for this paper was conducted at the Institute for Advanced Study, Princeton, and I acknowledge and value the Institute's support. A number of scholars have read this paper and/or made many helpful suggestions. I wish to thank James Banker, Glen Bowersock, Jane Chance, Jane Crawford, Giles Constable, Alexander De Grand, Gerald Elkan, Christian Habicht, Ann Hanson, Robert Lerner, John Noonan, Peter Rhodes, Steven Rowan, Miri Rubin, Gerald Surh and Steven Vincent. Kaye Greenlaw and William Inman assisted me with the editing.

non-fertile intercourse (what Philippe Ariès called "sexual perversity"), the rhythm method, coitus interruptus, vaginal suppositories, condoms, abortions, infanticide and child abandonment. In searching the historical records, however, it is difficult to find proof that any of these practices were sufficiently widespread to produce the results for which we do have evidence: that somehow, in some way, or through some combination of means, and during certain periods, families limited their rates of reproduction.

While it has been suggested that non-surgical abortifacients may have been effective (if only slightly) as a consequence of such a high level of toxicity as to constitute, in the words of Marie-Thérèse Fontanille, a "demographic danger" as a result of "catastrophic female mortality",[1] the idea that the use of contraceptives (in particular oral contraceptives) might have been significant has been rejected simply on the basis that those prescribed could not have been effective. Most of the contraceptives recorded in history are plant substances, and plants have been thought incapable of producing the complex animal molecular hormonal structures that affect fertility. Yet plants have long been used as sources of both contraceptives and early-term abortifacients. Evidence for such usage can be found throughout history, from the earliest known Egyptian medical document down to present-day traditional medical systems.[2] Despite the fact that there is anecdotal evidence in literary texts, and that there is also a great variety of legal, ecclesiastical, theological and medical sources which discuss contraceptives, modern historians have rejected the idea that these agents were functional birth-control measures because they think that modern science demonstrates that such substances could not have been effective. Ariès argued for the virtual absence of contraception in Europe before the seventeenth century on account of its "unthinkability", while Keith Hopkins, who studied the early history of contraception, describes ancient oral contraceptives as "ineffectual potions".[3] Scholarship has placed contraceptives more in the realm of magic than of science. My hypothesis is no more than the axiom that one should accept the testimony of the records unless there is compelling reason to reject their validity, *and we have good reason to accept their claims that these agents affected fertility.*[4]

---

[1] Marie-Thérèse Fontanille, *Abortement et contraception dans la médecine gréco-romaine* (Paris, 1977), p. 195. For source references, see also Enzo Nardi, *Procurato aborto nel mondo greco romano* (Milan, 1971). A recent study of the drugs used to induce abortions asserts that some may have been effective: Achim Keller, *Die Abortiva in der römischen Kaiserzeit* (Quellen und Studien für Geschichte der Pharmazie, xlvi, Stuttgart, 1988).

[2] See Kahnun Papyrii, nos. 21 (3/6), 22 (3/7), in Hildegard von Deines, Hermann Grapow and Wolfhart Westendorf, *Übersetzung der medizinischen Texte*, 2 vols. (Grundriss der Medizin der alten Ägypter, iv, Berlin, 1958), i, p. 277, ii, p. 211.

In justifying this claim, this article will proceed from a general review of the evidence provided by modern science concerning plant-based contraceptives and abortifacients to a consideration of a number of plants used in this way in ancient and medieval times. It will then consider medieval additions to classical knowledge, examining how medieval scholars updated texts, before moving on to consider more generally how knowledge of birth-control was transmitted, assimilated and, to some degree, lost.

I

PLANT-BASED CONTRACEPTIVES AND MODERN SCIENCE

The subject of plant-based contraceptives is complex, and requires an introduction. The follicle-stimulating hormone and luteinizing hormone-releasing factors necessary for ovulation which occur in mammals were thought to belong only to the animal and not to the plant kingdom. Two studies published in 1933 were the first to call this view into question. Boleslaw Skarzynski reported to the Polish Academy of Sciences that he had obtained a substance that resembled a human female hormone (trihydrooxyoestrin) from the willow.[5] In the same year Adolf Butenandt and H. Jacobi announced that the date palm and the pomegranate produced female sex hormones.[6] These reports were at first greeted with scepticism, because plant substances were not thought to function as human hormones and, moreover, because scientists could not duplicate Butenandt and Jacobi's laboratory results.[7]

---

[3] Philippe Ariès, *Histoire des populations françaises et de leurs attitudes devant la vie depuis le XVIII^{e} siècle* (Paris, 1948), pp. 494-521; see also a later arti[illegible] Philippe Ariès, "Sur les origines de la contraception en France", *Population*, viii (1953), p. 466, in which he defended his earlier position ("C'est la thèse de l'impensabilité que j'ai défendue"); Keith Hopkins, "Contraception in the Roman Empire", *Comp. Studies in Society and Hist.*, viii (1965-6), p. 131 n. (with reference to oral contraceptives in Dioscorides); for the same view, see Norman E. Himes, *Medical History of Contraception* (Baltimore, 1936; repr. New York, 1963). For some interesting material, see Shirley Green, *The Curious History of Contraception* (New York, 1971).

[4] Some readers of this article may claim that I am guilty of the sin of historical positivism because the study uses modern science to validate historical practices, and selected ones at that. I hope they will not. The current views about the effectiveness of birth-control rest on what earlier historians regarded as possible and this in turn was based on what contemporary science regarded as the rules of nature. Now, in 1991, science has expanded its knowledge, but historians have not taken into account the new findings. Since modern science gives us evidence that the contraceptives and abortifacients that our ancestors took did work, I am asking no more of my colleagues than that they consider the historical record at its face value, or, at least, confront it before rejecting it.

While the findings of Skarzynski, Butenandt and Jacobi had little immediate impact, however, the results of other important research on the anti-fertility effects of plants on mammals, in the field of animal science, were more generally accepted.[8] During the 1940s it was observed that Australian sheep grazing on a particular type of clover (*Trifolium subterraneum*) experienced sharply reduced fertility. The explanation was found to be the presence in the clover of isoflavonoids, which induce oestrogenic activity in mammals.[9]

Research in anthropology has also yielded important information, especially in studies where the findings are reinforced by laboratory tests. In 1960, following up reports that Thai women take an extract of the root *Pueraria mirifica* (a close relative of kudzu) to induce abortion, D. B. Bounds and G. S. Pope isolated a compound called miroestrol that is more medicinally active than oestrone.[10] Anthropological studies such as this one are important sources of data about actual usage.[11]

---

[5] Boleslaw Skarzynski, "An Oestrogenic Substitute from Plant Materials", *Nature*, cxxxi (1933), p. 766; Boleslaw Skarzynski, "Recherches sur les corps oestrogènes d'origine végétale", *Zoologischer Bericht*, xxxv (1933), p. 323.

[6] Adolf Butenandt and H. Jacobi, "Über die Darstellung eines krystallisierten pflanzlichen Tokokinins (Thelykinins) und seine Identifizierung mit dem α-Follikelhormon", *Zeitschrift für physiologische Chemie*, ccxviii (1933), pp. 104-12. Butenandt received the Nobel prize for chemistry in 1939.

[7] In 1965 and 1966, however, experiments succeeded in confirming Butenandt and Jacobi's findings. See Erich Heftmann, Shui-Tze Ko and Raymond D. Bennett, "Identification of Estrone in Pomegranate Seeds", *Phytochemistry*, v (1966), p. 1337; Raymond D. Bennett, Shui-Tze Ko and Erich Heftmann, "Isolation of Estrone and Cholesterol from the Date Palm, *Phoenix Dactylifera* L.", *Phytochemistry*, v (1966), pp. 231-5.

[8] See John R. Lacey, Lynn F. James and Robert E. Short, *The Ecology and Economic Impact of Poisonous Plants on Livestock Production* (Boulder, Colo., and London, 1988), esp. p. 9.

[9] H. W. Bennetts, E. J. Underwood and F. L. Shier, "A Specific Breeding Problem of Sheep on Subterranean Clover Pastures in Western Australia", *Australian Veterinary Jl.*, xxii (1946), pp. 2-12. All isoflavonoids are oestrogenic.

[10] D. B. Bounds and G. S. Pope, "Light-Absorption and Chemical Properties of Miroestrol, the Oestrogenic Substance of Pueraria Mirifica", *Jl. Chemical Soc.* (1960), pp. 3696-705; see also J. B. Harborne, *Introduction to Ecological Biochemistry*, 2nd edn. (London, 1982), p. 102.

[11] For references to such studies, see below, p. 31 n. 127.

Finally, other laboratory and clinical studies of the effect of plant substances on animal and human fertility frequently appear in Indian and Chinese medical and pharmaceutical journals. Here specific traditional crude drugs are scientifically tested as alternative sources for the now standard oestrogen-progesterone pills.

II

CONTRACEPTIVES AND EARLY-TERM ABORTIFACIENTS

A variety of plant substances have been used as oral contraceptives, and an even larger number as early-term abortifacients. Although ancient and medieval people distinguished between contraception and abortion, the difference is not always clear, as we shall observe in the cases of ferula and the pomegranate. A few other representative plants are also briefly discussed in this section.[12]

1) *Ferula*

Ferula is a genus of plants, commonly known as the giant fennel. The plant has yellow flowers and grows to the height of a small tree, although it is a scrub. It is found in semi-arid regions, on hillsides and stony slopes. The fragrant pith of the dry stems and the juice from its roots were popular medicines.

In antiquity, ferula was valued both as a contraceptive and as an early-term abortifacient. The ancients knew the difference. Soranus, a writer on gynaecology during the time of Trajan (A.D. 98-117) and Hadrian (A.D. 117-38), made the distinction as follows: "A contraceptive differs from an abortive (*Atokion de phthorion diapherei*), for the first does not let conception take place, while the latter destroys what has been conceived. Let us therefore call the one 'abortive (*phthorion*)' and the other 'contraceptive (*atokion*)' . . . it is safer to prevent conception from taking place than to destroy the foetus".[13]

The first two oral prescriptions mentioned by Soranus use two plants, *silphion* and *opopanax*, both possibly species of ferula.[14]

---

[12] These are only a selection of the plant-based drugs which I will discuss at greater length in a book: John M. Riddle, *A History of Oral Contraceptives and Early-Stage Abortifacients* (Harvard Univ. Press, forthcoming 1992; provisional title).

[13] Soranus, *Gynaecology*, i.60 (trans. Oswei Temkin, *Soranus' Gynecology*, Baltimore, 1956, pp. 62-3). For the Greek text, see Soranus, *Gynaeciorum libri iv*, ed. Johannes Ilberg (Corpus Medicorum Graecorum [hereafter C.M.G.], iv, Leipzig and Berlin, 1927); *Sorani Gynaeciorum*, ed. Valentin Rose (Bibl. Script. Graec. et Roman. Teubner. [hereafter Teubner.], Leipzig, 1882); Soranus, *Maladies des femmes*, ed. Paul Burguière, Danielle Gourevitch and Yves Malinas (Paris, 1988).

[14] *Ibid.*, i.63.

Opopanax was to be administered with *silphion*, and is our *Ferula opopanax* Spr., or — in some confused modern taxonomy — the closely related *Pastinica opopanax* L.[15] In the nineteenth century, a drug obtained from opopanax was thought to have had the same effects as the drugs from other species of ferula.[16] *Silphion* is a now extinct species of the same genus, which seems to have been collected out of existence.[17] The very high price of *silphion* was remarked in 424 B.C. by Aristophanes — "Don't you remember when a stalk of *silphion* sold so cheap"? — and its scarcity was commented on as early as the first century A.D. by Pliny the Elder.[18] Greek, Roman and medieval medical sources prescribed several species of ferula for anti-fertility effects: among the plants are *Ferula assa-foetida* L. (whose roots have a pronounced, foul smell resembling that of faeces — unforgettable and unmistakable!), *Ferula communis* L. (a source of the drug ammoniacum), *Ferula galbaniflua* Boiss. and Buhse (a source of the drug galbanum), *Ferula tingitana* L. (a source of ammoniacum) and *Ferula persica* Willd. (a source of sagapenum gum). The apparent reason for the extinction of *silphion* is that it was prized more highly than the related species, combined with the fact that ancient attempts to cultivate it were unsuccessful.[19]

---

[15] *Des Pedanios Dioskurides aus Anazarbos Arzneimittellehre in fünf Büchern*, ed. Julius Berendes (Stuttgart, 1902), p. 297 n. 9; the same plant is classified by D. J. Mabberley, *The Plant Book* (Cambridge, 1987), p. 413, as *Opopanax chironium*, but it is closely related to ferula. From the descriptions of *F. opopanax* Spr./*O. chironium* (L.) Koch, the plant closely resembles *Ferula palmyrensis* Post and Beauverd, in *Index Kewensis plantarum phanerogamarum*, suppl. vol. (Oxford, 1938), p. 114, and I suspect that Berendes's and Mabberley's plants may be *F. palmyrensis*, the plant mentioned by Soranus. Whether they are or not does not affect the important point, which is that their chemistry would be similar, albeit not precisely the same.

[16] Charles Pickering, *Chronological History of Plants: Man's Record of His Own Existence Illustrated through Their Names, Uses and Companionship* (Boston, 1879), p. 158; Friedrich A. Flückiger and Daniel Hanbury, *Pharmacographia: A History of the Principal Drugs of Vegetable Origin, Met with in Great Britain and British India*, 2nd edn. (London, 1879), p. 327.

[17] Alfred C. Andrews, "The Silphium of the Ancients: A Lesson in Crop Control", *Isis*, xxxiii (1941-2), pp. 235-6.

[18] Aristophanes, *Knights*, 893-4, trans. B. B. Rogers, *Aristophanes*, 3 vols. (Cambridge, Mass., and London, 1927), i, p. 213; Pliny, *Natural History*, xix.15.39-41; see also Chalmers L. Gemmill, "Silphium", *Bull. Hist. Medicine*, xl (1966), pp. 295-313; John Scarborough, *Pharmacy's Ancient Heritage: Theophrastus, Nicander, and Dioscorides* (Lexington, Ky., 1984), p. 76, proposing that the plant be called *Ferula cyrenaica* Diosc. in honour of Dioscorides.

[19] Theophrastus, *De historia et causis plantarum*, vi.3.2.5 (ed. and trans. Arthur Hort, *Enquiry into Plants and Minor Works on Odours and Weather Signs*, 2 vols., London, 1916, ii, p. 15).

A study carried out in 1963 confirmed that assafoetida is a contraceptive agent[20] as well as an abortifacient emmenagogue in humans.[21] (An emmenagogue is an agent that stimulates the menstrual function: thus, if there is a pregnancy, an emmenagogue will also cause an abortion.) Ferujol, the active substance in ferula, has been isolated experimentally. In animal tests it was nearly 100 per cent effective in preventing pregnancy when administered to adult rats within three days of coitus at a low dose of 0.6 mg./kg. body weight.[22]

Some early medical writers refer to one or more species of ferula as being either emmenagogues or abortifacients, but do not mention contraception. Dioscorides (*c.* A.D. 40-80) noted that *silphion* induced menstruation, but discussing other species of the same genus he remarked that the plants caused abortion. Galen (A.D. 129-210 or later) and Aetius of Amida (*c.* A.D. 502-75) made similar observations.[23] What are we to make of this apparent confusion between abortion and contraception?

Even though some of the ancients were semantically correct, there appear to be functional complications. An abortifacient is an agent that terminates pregnancy; in modern medicine the agents producing this action are called ecbolics, oxytocics and emmenagogues. As already noted, emmenagogues are agents that provoke menstruation whether or not an embryo is present, but since these menstrual agents are not clearly described as such in historical records, historians have not recognized them as such, let alone as abortifacients. The first perceptible evidence of pregnancy is an interruption of the menstrual cycle. But amenorrhoea (the absence or suppression of menstruation) can also be caused by a variety of conditions including febrile and chronic diseases, malnutrition and mental depression. Moreover it is fairly common in conditions other than pregnancy. A physician or a herbalist could not know the aetiology of amenorrhoea reported by a patient within, say, the first months of pregnancy without the sort of tests (now available) which were not known to an ancient or medieval physician. It is difficult to distinguish between idiopathic (genuine) amenorrhoea and early pregnancy, especially if the physician has not conducted a careful case history with a patient who is completely honest. In the mid-nineteenth century, after abortion became a criminal offence in many Western countries (in England in 1803), Charles Meigs, M.D., advised that "The stupidest thing a physician can do, is to be misled by complaints to the administering of drugs and medicines, which may bring on, not the menses, but an abortion, or a premature labor".[24] For this reason traditional emmenagogues were dropped from "official" pharmacy in many countries.

---

[20] Norman R. Farnsworth *et al.*, "Potential Value of Plants as Sources of New Antifertility Agents: I", *Jl. Pharmaceutical Sciences*, lxiv (1975), pp. 554, 590. The medicine enjoys a British and an Indian patent (British pat. 1,025,372 [Cl.A 61k], 6 Apr. 1956; Indian appl., 25 July 1963). In the human experiment the following were taken in equal doses daily for twenty-two days while abstaining from sexual coitus: 4 drams of the active principle from *Empbelia ribes*; 4 drams, *Piper longum*; 2 drams, assafoetida (ferula); and 4 drams of borax (soda). Ferula plants contain both ferulic acid and valeric acid. One species, *Ferula moshchata* Kozo-Polj., is employed in folk medicine in Central Asia: see Keller, *Abortiva*, p. 174.

[21] Farnsworth *et al.*, "New Antifertility Agents: I", p. 576; J. C. Saha, E. C. Savini and S. Kasinathan, "Ecbolic Properties of Indian Medicinal Plants", *Indian Jl. Medical Research*, il (1961), p. 136; M. M. Singh *et al.*, "Contraceptive Efficacy and Hormonal Profile of Ferujol: A New Coumarin from Ferula jaeschkeana", *Planta medica*, li (1985), pp. 268-70, reporting that pregnancy is prevented when an extract of *Ferula jaeschkeana* is given to female rats 1-5 days after coitus.

[22] Singh *et al.*, "Contraceptive Efficacy . . . of Ferujol", pp. 268-70. The statistical reduction was significant: there was less than 1 per cent chance of pregnancy. See also Farnsworth *et al.*, "New Antifertility Agents: I", p. 576; James A. Duke, *C.R.C. Handbook of Medicinal Herbs* (Boca Raton, 1985), pp. 194-5.

[23] Dioscorides, *De materia medica*, iii.48, 80, 81, 83, 84 (ed. Max Wellmann, 3 vols., Berlin, 1906-14; repr. Berlin, 1958); Galen, *De simplicium medicamentorum temperamentis ac facultatibus*, viii.16.4 (ed. C. G. Kühn, *Claudii Galenii opera omnia* [hereafter *Opera omnia*], 20 vols., Leipzig, 1821-33; repr. Hildesheim, 1964, xii, p. 95); Aetius of Amida, *Iatricorum*, xvi.18 (ed. Skévos Zervòs, *Peri tōn en mētrai pathōn*, Leipzig, 1901).

For the purposes of this paper, I shall use the term "abortifacient" as embracing all forms of pregnancy termination that occur even shortly after implantation. Although some religious and ethical doctrines stress the critical dividing-line as the instant in which fertilization takes place, this is not used as the dividing-line in modern medicine, because any agent that interferes with the ovary transport, pre- or post-coitum, and prevents or impairs implantation, is none the less a contraceptive.[25]

Therefore — to answer the question about the ancients' interchanging terms for contraceptives and abortifacients — there appear to be grounds for the confusion. Aetius of Amida and Paul of Aegina (seventh century) both noted a series of steps that a woman should take to avoid pregnancy, namely diets, bathing regimens, exercises and oral and applied drugs — and, should the menstrual cycle be delayed, different regimens and other, stronger drugs.[26] The words for emmenagogues and abortifacients were also interchangeable. For example, the words for abortifacients in the Greek text of Oribasius (*fl.* A.D. 385) were translated into Latin as emmenagogues.[27] The Latin version of Dioscorides, made in or around the sixth century, translates Dioscorides' phrase "drives out the menses" (*agōgas emmēnōn*) as "it causes an abortion" (*abortum facit*).[28] In part this confusion of terms may reflect increased medieval sensitivity to the issue of abortion, but this was not universal, since throughout the Middle Ages there were medical writers giving prescriptions explicitly for birth-control.

---

[24] Charles D. Meigs, *Females and Their Diseases* (Philadelphia, 1848), p. 405.

[25] For example, Anthony A. Elujoba, Stella O. Olagbende and Simeon K. Adesina, "Antiimplantation Activity of the Fruit of Lagenaria Breviflora Robert", *Jl. Ethnopharmacology*, xiii (1985), pp. 281-8, reports that this plant is used as an abortifacient in Nigeria, but is actually an anti-implantation agent: 5g./kg. of the fruit pulp yielded 100 per cent activity: that is to say, all who took this amount aborted/failed to conceive.

2) *Pomegranate, an Oral Contraceptive and Vaginal Suppository*

An examination of Soranus' vaginal suppositories provides a background for a closer look at oral contraceptives. Soranus gave six recipes for vaginal suppositories to be taken after the cessation of menstruation, five of which use the peel or rind of a pomegranate.[29] Pomegranate (*Punica granatum* L.) was prescribed in other classical and medieval medical sources. In Greek mythology, moreover, Proserpine ate pomegranate seeds, contrary to Zeus' order, thus preventing her return to earth for more than part of the year, along with the return of fertility. For as many seeds as she ate, she was destined to stay that many months in the Underworld.[30] Pomegranate is also recognized as an abortifacient in ancient Indian literature and in modern folk medicine.[31]

---

[26] Aetius of Amida, *Iatricorum*, xvi.16-18; Paul of Aegina, *Epitomae medicae*, iii.60.12, 29-34 (ed. J. L. Heilberg, 2 vols., C.M.G., ix, Leipzig, 1921).

[27] Oribasius, *Synopsis*, ii.53 (ed. Charles Daremberg and C. Bussemaker, *Oeuvres d'Oribase*, 6 vols., Paris, 1851-76; repr. Amsterdam, 1962, v, p. 68); *ibid.* (ed. Johannes Raeder, 5 vols., C.M.G., vi, Leipzig, 1926, iii, p. 43); cf. *Oribasius Latinus*, ed. Henning Mørland (Symbolae Osloensis, fasc., suppl., x, Oslo, 1940), pp. 75, 118, 148.

[28] Dioscorides, *De materia medica*, iii.123.1.5; cf. bk. 3 of the old Latin translation, in "Dioscorides Longobardis (Cod. Lat. Monacensus 337)", ed. Hermann Stadler, *Römanische Forschungen*, x (1898), p. 432.

[29] Soranus, *Gynaecology*, i.62.

[30] Ovid, *Metamorphoses*, v.523-50; W. Smith (ed.), *Dictionary of Greek and Roman Biography and Mythology*, 3 vols. (London, 1849), iii, p. 204.

[31] Saha, Savini and Kasinathan, "Ecbolic Properties of Indian Medicinal Plants", p. 140; John Mitchell Watt and M. G. Breyer-Brandwijk, *The Medicinal and Poisonous*

(cont. on p. 12)

This is the plant which Butenandt and Jacobi identified as a contraceptive in the 1930s, an observation confirmed by more recent scientific studies.[32] In laboratory experiments, when paired with males not treated with the plant, female rats fed pomegranate experienced 72 per cent less pregnancies than the control group. In similar tests with guinea pigs none became pregnant. Forty days after the withdrawal of the drug the fertility of both rats and guinea pigs was back to normal.[33] Another laboratory test, on a pomegranate extract not containing the root, resulted in a 70 to 90 per cent inhibition of pregnancy in rats. The scientists conducting the investigation concluded that different extraction methods and morphological plant loci (such as roots, stem or flower) may influence the results,[34] which holds true as a generalization about all herbal substances regardless of how they are administered or applied.

Despite pomegranate's association with limiting fertility, however, it appears to have been seldom used in classical and medieval medicine, to judge from the small number of references to it in medical works and the scarcity of anecdotal literary sources. There is no citation of its use as an oral contraceptive, but only as a suppository, the effectiveness of which is not clearly known. For instance, pomegranate is not mentioned in the various works

---

(n. 31 cont.)
Plants of Southern and Eastern Africa, 2nd edn. (London, 1962), pp. 875-6, noting anti-fertility uses in Mauritius and Sumatra.

[32] Heftmann, Ko and Bennett, "Identification of Estrone", pp. 1337-9; P. D. G. Dean, D. Exley and T. W. Goodwin, "Steroid Oestrogens in Plants: Re-estimation of Oestrone in Pomegranate Seeds", *Phytochemistry*, x (1971), pp. 2215-16, reporting smaller amounts of oestrogens than those found by Heftmann, Ko and Bennett, and concluding that there may be seasonal variations; Norman R. Farnsworth *et al.*, "Potential Value of Plants as Sources of New Antifertility Agents: II", *Jl. Pharmaceutical Sciences*, lxiv (1975), p. 718. Another animal test demonstrates that pomegranate prevents fertilization at a 50 per cent rate in rats: Anand O. Prakash, "Potentialities of Some Indigenous Plants for Antifertility Activity", *Internat. Jl. Crude Drug Research*, xxiv (1986), p. 23.

[33] M. L. Gujral, D. R. Varma and K. N. Sareen, "Oral Contraceptives: Part 1: Preliminary Observations on the Antifertility Effect of Some Indigenous Drugs", *Indian Jl. Medical Research*, xlviii (1960), p. 50. Another experiment, using the isolated uterus of an albino rat to test compounds, found a "moderate increase in amplitude and frequency of contractions without appreciated alteration in tone" with pomegranate: B. N. Dhawan and P. N. Saxena, "Evaluation of Some Indigenous Drugs for Stimulant Effect on the Rat Uterus: A Preliminary Report", *Indian Jl. Medical Research*, xlvi (1958), p. 811.

[34] A. O. Prakash *et al.*, "Anti-Implantation Activity of Some Indigenous Plants in Rats", *Acta Europae fertilitatis*, xvi (1985), p. 447.

of the Hippocratic Corpus as an anti-fertility agent; nor does it appear in this capacity in the works of antiquity's foremost authority on drugs, Dioscorides. Again, it is absent from the works of Galen; it is, however, prescribed by Ibn Sīnā (Avicenna, *c.* 980-1037) as a pre- and post-coital suppository together with alum, while the Latin translation appears to prescribe oral administration without the alum.[35] Soranus stated that suppositories (which is how he classified pomegranate) were more dangerous than oral contraceptives.[36] Contrary to popular opinion, the ancient Hippocratic Oath did not prohibit abortions; the oath prohibited "vaginal suppositories" presumably because of the ulcerations that they were said to cause.[37] Soranus and other medical authorities recognized what folk medicine must have learned from experience: that while pomegranate was effective, there were other substances that prevented pregnancy which were more effective, easier to administer and less dangerous.

3) *Juniper*

"Gossip records a miracle", states Pliny the Elder: "that to rub it [crushed juniper berries] all over the male part before coitus prevents conception".[38] Dioscorides adds that crushed juniper berries (probably *Juniperus communis* L.) could be placed on the vulva prior to coitus as a contraceptive.[39] Galen refers to two species of juniper as being both a "contraceptive drug" (*atokion esti pharmakon*) and an abortifacient (the verb *ekballei*, "it aborts" or "it expels").[40] More recently, German women in the late nineteenth and early twentieth centuries took savin, from *Juniperus sabina* L., as an abortifacient.[41] Pliny's and Dioscorides' prescriptions were for vaginal insertion, but other sources are unclear as to the means of administration.

---

[35] Ibn Sīnā (Avicenna), *Liber canonis*, ii.2.578 (trans. Gerard of Cremona, Venice, 1507; fac. repr. Hildesheim, 1964, fo. 146^{v}). The Arabic text is discussed in B. F. Musallam, *Sex and Society in Islam: Birth Control before the Nineteenth Century* (Cambridge, 1983), pp. 72, 84, *passim*.

[36] Soranus, *Gynaecology*, i.61-3. Specifically, he said that the suppositories were styptic, clogging, cooling and caused ulcerations.

[37] As translated by Ludwig Edelstein, "The Hippocratic Oath: Text, Translation and Interpretation", in *Ancient Medicine: Selected Papers of Ludwig Edelstein*, ed. O. and C. L. Temkin (Baltimore, 1967), p. 6, it states: "Similarly I will not give to a woman an abortive remedy". The critical Greek words here are *pesson phthorion*, which mean "expulsive (*or* abortive) pessary/suppository". For a discussion, see Charles Lichtenthaeler, *Der Eid des Hippokrates: Ursprung und Bedeutung* (Cologne, 1984), pp. 144-52. A Muslim writer, Abu al-Hasan al-Tabib, in explaining why abortions were important if the mother's life was in danger, commented that "This is the reason Hippocrates demands the use of abortive drugs before childbirth": quoted in Musallam, *Sex and Society in Islam*, p. 70.

[38] Pliny, *Natural History*, xxiv.11.18, trans. from the edition by W. H. J. Jones, 10 vols. (Cambridge, Mass., and Boston, 1980), vii, p. 17. Pliny's *cedrus* was probably *Juniperus excelsa* Bieb.

[39] Dioscorides, *De materia medica*, i.77.2.7.

In an experiment the results of which were published in 1986, 200 mg. of an extract of juniper root (*Juniperus communis* L.) were administered orally to laboratory rats with the result of 60 per cent effectiveness in preventing implantation,[42] thus confirming it to be an oral contraceptive (as I classify anti-implantation agents following the medical convention outlined above). Juniper berries were a part of our pharmacopoeia until the last century, as a uterine stimulant. They act as an emmenagogue affecting the menstrual cycle, oils from the leaves are shown by *in vitro* and *in vivo* tests in animals to be uterine stimulants. In experiments on the isolated human uterus and Fallopian tubes, the oils have caused relaxation and inhibited movement to an extent that could lead to an abortion. In fact, there are medically attested cases of abortion induced by juniper toxins.[43] Thus, to judge from what we know now, juniper may have been administered orally or applied externally with both contraceptive and abortifacient results, just as Galen and other classical and medieval medical authorities suggested.

4) *Rue*

Rue (*Ruta graveolens* L.) is a hardy evergreen perennial, a somewhat scrubby plant about eighty centimetres high, with a lax-branched cluster of yellow to yellowish-green flowers. In the garden rue emits a powerful, disagreeable odour. It contains philocarpine, a substance given to horses to induce an abortion.[44]

---

[40] Galen, *De simplicium medicamentorum*, vi.2.15 (ed. Kühn, xi, p. 854). Galen's *brathu* is probably *Juniperus sabina*.

[41] James Woycke, *Birth Control in Germany, 1871-1933* (London, 1988), pp. 17-18 *passim*; see also V. J. Brøndegaard, "Der Sadebaum als Abortivum", *Sudhoffs Archiv für Geschichte der Medizin und Naturwissenschaften*, xlviii (1964), pp. 331-51.

[42] Prakash, "Potentialities of Some Indigenous Plants", p. 23; see also Prakash *et al.*, "Anti-Implantation Activity", pp. 441, 447.

[43] G. Fredrichs, G. Arends and H. Zörnig, *Hager's Handbuch der pharmazeutischen Praxis*, 3 vols. (Berlin, 1949 [*c.* 1944]), i, p. 1572; Duke, *C.R.C. Handbook of Medicinal Herbs*, p. 256.

[44] Farnsworth *et al.*, "New Antifertility Agents: I", p. 574, based on findings from ten separate studies; the veterinary use of philocarpine is described in *The Merck's Index*, 7th edn., ed. P. G. Stecher (Rahway, 1960), p. 818; Henry de Laszlo and Paul S. Henshaw, "Plant Materials Used by Primitive Peoples to Affect Fertility", *Science*, cxix (1954), p. 629.

This plant is a traditional abortifacient among the Hispanic people in New Mexico,[45] and is used as a tea for abortive purposes throughout Latin America. The report carrying this latter observation also describes experiments on rats that indicate abortifacient activity, but suggests that the "clearest effect is a contraceptive one" in preventing implantation.[46] Modern Chinese, Latin American and Indian medical authorities recognize rue's abortifacient quality,[47] with one manual warning that pregnant women should avoid it because of its emmenagogic properties.[48] Chinese scientists have studied the active substance in a related species, *Murraya paniculata*/var. *M. sapientum* L., in the same family (*Rutaceae*), called *yuehchukene*. This substance is 100 per cent active in preventing pregnancies in rats when administered orally at 2 mg./kg. during the first six days of pregnancy. A single dose at 3 mg./kg. is 100 per cent effective on the first day after coitus. It looks promisingly potent as a future postcoital interceptor.[49]

In his *Herball*, John Gerard (1545-1612) said that rue ought "not be admitted to meat or medicine".[50] Just the same, rue was important to medicine. As with pomegranate, Soranus named rue as an oral contraceptive as well as a vaginal suppository.[51] From the modern evidence it is clear that Soranus' prescription would have had an anti-fertility effect as both a contraceptive and an abortifacient. In sharp contrast to Gerard, Pliny the Elder thought that "rue is among our principal medicines".[52] Pliny said that rue promoted menstruation, brought away the afterbirth and expelled a dead foetus (or embryo), a common circumlocution for abortion.[53] He contended, just like the modern manual, that "Pregnant women must take care to exclude rue from their diet, for I find that the foetus [*or* embryo] is killed by it".[54] Galen offered a number of anti-fertility uses for rue,[55] among them an oral-route prescription named after Orbanos.[56]

---

[45] George A. Conway and John C. Slocumb, "Plants Used as Abortifacients and Emmenagogues by Spanish New Mexicans", *Jl. Ethnopharmacology*, i (1979), pp. 247-8.

[46] Martha O. Guerra and Amaury T. L. Andrade, "Contraceptive Effects of Native Plants in Rats", *Contraception*, xviii (1978), pp. 191-9, esp. p. 198.

[47] Duke, *C.R.C. Handbook of Medicinal Herbs*, p. 417; M. Terra, *The Way of Herbs* (Santa Cruz, 1980), p. 113; A. Y. Leung, *Encyclopedia of Common Natural Ingredients Used in Food, Drugs, and Cosmetics* (New York, 1980), p. 409; B. S. Malhi and V. P. Trivedi, "Vegetable Antifertility Drugs of India", *Quart. Jl. Crude Drug Research*, xii (1972), p. 1927.

[48] Terra, *Way of Herbs*, p. 113.

[49] Yun Cheung Kong, Jing-Xi Xie and Paul Pui-Hay But, "Fertility Regulating Agents from Traditional Chinese Medicines", *Jl. Ethnopharmacology*, xv (1986), p. 4.

[50] John Gerard, *The Herball: or Generall Historie of Plants* (London, 1636; repr. New York, 1985), p. 268.

[51] Soranus, *Gynaecology*, i.63.

[52] Pliny, *Natural History*, xx.51.131.

Gargilius Martialis, a retired soldier in North Africa during the third century A.D., described the medical knowledge appropriate to an estate-owner.[57] He gave scant attention to female problems: there is only one mention of contraceptives and abortifacients. Gargilius valued rue, but concluded with a point emphasizing the hazards which might attend its unwitting use by ignorant women: "Some very foolishly declare the damage rue causes: that it inhibits, debilitates the generative seed, and kills embryos in the womb. By itself it does not bring these results; they are due to the people who employ it without considering its strength, its dosage, or the circumstances. Therefore a man [person] of judgement employs it in moderation so that it may not become a poison, rather than a remedy".[58]

Even after Christianity became dominant, late Roman and early Byzantine medical writers continued to relate information about rue's anti-fertility properties. Oribasius called rue an emmenagogue, but the Latin translation explicitly said abortifacient.[59]

---

[53] *Ibid.*, xx.51.139. Here, as throughout when dealing with sources, I am not making the distinction between embryo and foetus made by modern medicine. Johannes Fischer, *Die Gynäkologie bei Dioskurides und Plinius* (Vienna, 1927), pp. 6-7, observes that Dioscorides used the phrase or one similar to "it aborts a dead foetus" (*ta tethnēkota embrua ektinassei . . . ekballei*): see other examples in Dioscorides, *De materia medica*, iii.32.1.6, iii.32.83.2.1, iii.32.112.2.6-7. In i.78.2.8, the wording is "it kills the foetus" (*embrua phtheiron kai emmēna kinoun*); see also *ibid.*, ii.155.1.3-4. Pliny uses the Latin equivalents of "expelling a foetus" (*embrua kinei . . . agei*, etc.), phrases such as "it drives out also a dead birth" (*partus quoque emortuos pellit, Natural History*, xx.34.86), and "it ejects a faulty birth" (*defunctos partus eicit, ibid.*, xx.54.154).

[54] Pliny, *Natural History*, xx.51.143, trans. Jones, vi, pp. 82, 84.

[55] Galen, *De simplicium medicamentorum*, v.23 (ed. Kühn, xi, p. 777), viii.18 (xii, p. 101); Galen, *De remediis parabilibus*, ii.18-22 (ed. C. G. Kühn, *Opera omnia*, xiv, pp. 480-2); Galen, *De antidotis*, ii.1 (ed. C. G. Kühn, *Opera omnia*, xiv, pp. 114-15), ii.9 (pp. 152-3).

[56] "Antidotos ē Orobanou . . . pros to ta entos brephē ekballein": Galen, *De antidotis*, ii.1 (ed. Kühn, xiv, pp. 109-11).

[57] John M. Riddle, "Gargilius Martialis as a Medical Writer", *Jl. Hist. Medicine and Allied Science*, xxxix (1984), pp. 408-29.

[58] Gargilius Martialis, *Medicinae ex oleribus et pomis*, iii (ed. Valentin Rose, *Plinii Secundi quae fertur una cum Gargilii Martialis medicina*, Teubner., Leipzig, 1875, p. 137); *Materia Medica of Gargilius Martialis*, trans. Ruth Melicent Tapper (Madison, Wis., 1908), p. 26 (available via University Microfilms International).

[59] Above, p. 11 n. 27.

Theodorus Priscianus (*fl.* A.D. 367-83) and Pseudo-Galen's treatise *Ad Paternianum* both said that rue was given to induce an abortion.[60] Paul of Aegina discussed rue in greater detail, seemingly copying from no single source. In discussing gynaecology, Paul outlined a regimen for delayed menstruation or amenorrhoea, since this was preferable, he said, to drugs as a first therapeutic measure. This regimen included exercises and a special diet consisting of a variety of seafood. If the condition persisted, however, for three to four days the woman was advised to drink a soup of shellfish boiled with leeks, pepper and rue. If this failed Paul suggested a vaginal suppository, again containing rue.[61] It should be noted that in his section on pharmacy, however, Paul described rue as a calefacient (warming medicine) and desiccant, and said that it curbed sexual desire: he did not explicitly state that rue was an anti-fertility agent.[62] Guided by Hippocratic theory, however, a physician would nevertheless know that a dessicant quality was needed to dry the sperm in an anti-fertility treatment. From medical writings, such as this one by Paul, even when anti-fertility is not explicitly specified, the physician would have known how to apply the agents according to their qualities — assuming proper training and competency, of course.

Islamic medical writers, such as Rāzi (Rhazes, *c.* 865-925) and Ibn Sīnā, recommended rue as a contraceptive and abortifacient.[63] When Gerard of Cremona (*c.* 1114-87) translated Ibn Sīnā into Latin, he nevertheless made no concessions to the church's position on reproduction, faithfully translating the discussions and recipes for contraception and abortion.[64] In the treatise *On Degrees* (Latin translation by Constantine the African, eleventh century), drugs are prescribed according to the degree of intensity of their pharmaceutical actions, beginning with weak drugs (one degree of activity) and leading up to extremely strong and dangerous drugs which exhibit four degrees of activity. Rue, which displays the strongest of these degrees of intensity, was "drunk with oxymelle to dry out the sperm and kill the desire for intercourse . . . [and it] expels the menstrua".[65] This underlines the point about qualities made when discussing Paul of Aegina. In the seventeenth century, moreover, the action of anti-fertility agents could be expressed as "drying" the seed "without adversely affecting lust". William Langham in his *The Garden of Health* (1598) states, for instance, that "Rue eaten a certain space, drieth up natural seede in man", and also that "teeming women may not eate Rue for hindering their conception".[66]

---

[60] Theodorus Priscianus, *Euporiston*, iii., *Gynaecia*, 6. (*De aborsu*), 23-7 (ed. Valentin Rose, Teubner., Leipzig, 1894); Pseudo-Galen, *Liber de simplicibus medicaminibus ad Paternianum*, in *Galenus omnia quae extant*, 11 vols. in 5 (Venice, 1556), iii, pt. 2, fo. 91^{v}.

[61] Paul of Aegina, *Epitomae medicae*, iii.61.5.1-5 (ed. Heilberg, i, pp. 275-6).

[62] *Ibid.*, vii.3, s.v. *rēganon* (ed. Heilberg, ii, p. 251, ll. 23-7).

[63] Musallam, *Sex and Society in Islam*, pp. 67-70, 84, 146-7.

[64] Ibn Sīnā, *Liber canonis*, trans. Gerard of Cremona, iii.21.8-14, on abortion (ch. 12 entitled "De regimine abortus et extractione fetus mortui"); iii.21.17, on ways to avoid pregnancy which include a suppository with elephant dung. Another way in which contraceptive and abortifacient information was related can be seen in *ibid.*, ii.2, on simple drugs: for example, rue in ch. 578.

Although rue continues to be employed as an anti-fertility agent in folk medicine, its use in Western medicine was discontinued by the nineteenth century.[67]

5) *Pennyroyal*

Aristophanes' play *Peace* was first produced in 421 B.C. It is a comedy about what was a serious subject for the Athenians who, despite the war with the Spartans, probably packed the theatre, where they heard Hermes tell Trigaius, in need of a companion: "Then on these terms I'll give you Harvesthome/ To be your bride and partner in your fields. Take her to wife, and propagate young vines". Trigaius replies: "O Harvesthome! come here and let me kiss you. But, Hermes, won't it hurt me if I make too free with fruits of Harvesthome at first?". Hermes reassures him: "Not if you add a dose of pennyroyal".[68]

Commenting on this exchange, a Byzantine scholiast explained that pennyroyal (*Mentha pulegium* L.) was used in a medicinal draught that counteracted the effects of eating too much fruit.[69] The scholiast was not too far out. Pennyroyal was used both as a contraceptive and an abortifacient, as Aristophanes' audience knew — otherwise no laughter. Again, in the play *Lysistrata*, Aristophanes produced a *double entendre* when a woman, who was not pregnant (unlike the Athenian Lysistrata), arrived from Boeotia: "A very lovely land,/ Well cropped, and trimmed, and spruced with pennyroyal".[70]

---

[65] Bayerische Staatsbibliothek, Munich, MS. lat. 267, c. xiv, Constantine the African, *De gradibus*, fo. 128^{v}; also in *Constantini Africani opera* (Basle, 1536), p. 386.

[66] William Langham, *The Garden of Health* (London, 1598), p. 545; see also p. 547: "It is not good . . . for women with childe". For a discussion, see Angus McLaren, *Reproductive Rituals: The Perception of Fertility in England from the Sixteenth Century to the Nineteenth Century* (London and New York, 1984), pp. 73-4.

[67] Jonathan Pereira, *The Elements of Materia Medica and Therapeutics*, 2 vols. (Philadelphia, 1854), ii, p. 877.

[68] Aristophanes, *Peace*, 706-12, trans. B. B. Rogers, *Aristophanes*, ii, pp. 64-5.

[69] *Scholia in Aristophanes*, ii, *Pacem*, ed. D. Holwerda (Groningen, 1982), p. 110, scholia 712a; cf. *Scholia Aristophanica*, ed. William G. Rutherford, 3 vols. (London, 1896), ii, p. 111.

Dioscorides said that pennyroyal was an abortifacient.[71] A late Roman writer, Quintus Serenus (d. A.D. 212), observed that when a pregnancy was less than a month old and the foetus (embryo) was weak, one should "rush into the bedroom" to administer pennyroyal in tepid water to the woman.[72] Other references in classical sources confirm that pennyroyal was used in anti-fertility treatments.[73] Pennyroyal is also recommended in medieval sources as an emmenagogue and/or abortifacient.[74] In the sixteenth century, Langham wrote that the herb, consumed after being soaked in wine, would "provoke the termes and . . . bring foorth . . . dead fruite";[75] while two recent studies of birth-control, one on early modern England, the other on late nineteenth-century and early twentieth-century Germany, report numerous instances of women taking the same plants as their classical and medieval counterparts.[76]

Modern science again endorses our ancestors' practice. Pennyroyal is used in Europe as an emmenagogue and, in 1978, a young woman in Colorado died as a result of taking pennyroyal *oil* to induce an abortion.[77] The plant cannot be legally sold as a drug in

---

[70] Aristophanes, *Lysistrata*, 87-9, trans. B. B. Rogers, *Aristophanes*, iii, pp. 14-15.

[71] Dioscorides, *De materia medica*, 3.31.1.2.

[72] Quintus Serenus Sammonicus, *Liber medicinalis*, xxxii (ed. R. Pépin, Paris, 1950, p. 34). The text is corrupt at this point: see the edition by Frederic Vollmer, *Quinti Sereni liber medicinalis* (Corpus Medicorum Latinorum [hereafter C.M.L.], ii, fasc. iii, Leipzig, 1916), p. 31. Pépin's text reads: "At qui olim menses minus octo moratus in aluo est/ Inrumpit thalamos et nexus soluit inertes/ Puleium [pennyroyal] ex acido bene conuenit imbre tepenti/ Cuius opem veram casus mihi saepe probarunt". Pépin translates "nexus soluit inertes" as "it loosens the bonds" (*rompt ses liens relâchés*), but to me the sense points to a "weakened one" (*inertes* = embryo/foetus), which is, as we have seen, a circumlocution to justify abortion.

[73] See John Scarborough's excellent article, "Contraception in Antiquity: The Case of Pennyroyal", *Wis. Acad. Rev.*, xxxv (1989), pp. 19-25.

[74] For example, see Pseudo-Apuleius, *Herbarius*, xciii (ed. Ernest Howald and Henry Sigerist, C.M.L., iv, Leipzig, 1927, p. 198); see also the English version of *Herbarius Apulei*, xciv, in *Leechdoms, Wortcunning and Starcraft of Early England*, ed. Thomas Oswald Cockayne, 3 vols. (London, 1864; repr. 1965), i, p. 286.

[75] Langham, *Garden of Health*, p. 478.

[76] McLaren, *Reproductive Rituals*, pp. 73-5; Woycke, *Birth Control in Germany*, pp. 16-19.

[77] "Fatality and Illness Associated with Consumption of Pennyroyal Oil — Colorado", *Morbidity and Mortality Weekly Report*, 22 Dec. 1978, pp. 511-13. Three

(cont. on p. 20)

the United States, but it is employed in modern folk medicine both as an abortifacient and emmenagogue.[78] It is nevertheless true that a twentieth-century European theatre audience in Berlin or London might miss the joke about pennyroyal which apparently entertained the Athenian theatregoer in the fifth century B.C.

6) *Squirting Cucumber*

The squirting cucumber (*Ecballium elaterium* L.) looks rather like the familiar garden cucumber, but has no tendrils. This perennial plant grows on waste ground, verges and cultivated areas. Its leaves are heart-shaped and rough, and the fruit is ovoid-cylindrical, being four to five centimetres long. Despite Freudian suggestions to the contrary, the English name for this plant derives from the fact that when its fruit dries it squirts out its seeds — its anti-fertility use being just coincidental.

A Hippocratic treatise on women's problems claimed that the squirting cucumber was good as "an abortive suppository for the uterus" (*ekbolion husterōn*), and, the author(s) added, "there is nothing that is better".[79] Galen and Dioscorides both described the plant as an abortifacient.[80] Oribasius, Paul of Aegina and Mustio (a gynaecological writer from around the sixth century A.D.) called it an emmenagogue, whereas the later author of a Latin herbal attributed to Apuleius is more specific, saying it is "for an abortion" (*ad abortum*).[81] By the sixteenth century

---

(n. 77 cont.)
pregnant women allegedly read that pennyroyal induced an abortion and took its oil (marketed as an insect repellent and herbal fragrance). One became ill and, after recovering in hospital, was persuaded to undergo a legally induced abortion; the second case was examined and discharged, and there is no further information concerning the outcome of the pregnancy (which was confirmed). The third, lethal case may have been an attempted suicide. Because pennyroyal oil is highly concentrated, its effect would be much more severe than pennyroyal tea. The unfortunate young woman consumed the equivalent of *fifty gallons* of pennyroyal tea. This calculation was made by Norman Farnsworth and communicated to me by Mark Blumenthal (3 May 1990).

[78] Farnsworth *et al.*, "New Antifertility Agents: I", p. 564; Watt and Breyer-Brandwijk, *Medicinal and Poisonous Plants*, p. 523.

[79] *De mulierum affectibus*, i.78 (ed. E. Littré, *Oeuvres complètes d'Hippocrate*, 12 vols., Paris, 1839-61; repr. Amsterdam, 1982, viii, p. 178, ll. 12-14).

[80] Galen, *De simplicium medicamentorum*, viii.18.15 (ed. Kühn, xii, p. 122); Dioscorides, *De materia medica*, iv.150.7.4-5.

[81] Oribasius, *Euporistes*, ii.1.3 (ed. Charles Daremberg and C. Bussemaker, *Oeuvres d'Oribase*, v, p. 635); Mustio, *Pessaria*, ed. Valentine Rose, *Sorani Gynaeciorum vetus translatio latina* (Teubner., Leipzig, 1882), pp. 123-5; Paul of Aegina, *Epitomae medicae*, vii.3, s.v. *elatērion* (ed. Heilberg, ii, p. 209, ll. 6-7); Pseudo-Apuleius, *Herbarius*, cxiv (ed. Howald and Sigerist, p. 199).

Langham was a little less direct, writing that the herb "expel[s] the termes and dead childe".[82] Linnaeus even gave the plant a scientific name from the Greek meaning "abortion", "Ecballium", although the ancient Greek name was *sikus agrios*.

The anti-fertility associations are confirmed by recent animal tests, although they demonstrate contraceptive, not abortifacient, activity. When mice were given daily doses of between 20 and 100 mg./kg. of extracts derived from both the whole plant and the flower alone, they failed to ovulate.[83]

7) *Queen Anne's Lace*

Queen Anne's lace (sometimes known as daucus or the wild carrot: *Daucus carota* L.), has a reddish, slender and strongly aromatic root with stems about two feet high. Both stem and leaves are covered with coarse hair. According to legend, the tiny red specks in flowers of a white to purple cluster are the blood of Queen Anne spilt when she pricked her finger when making lace. Today, women in the Appalachian mountains of North Carolina gather the seeds in the autumn. After coitus, a woman taking a spoonful of the seeds in a glass of water is confident that she will not conceive.[84] Those few women who today know about Queen Anne's lace are heirs to birth-control knowledge which it seems was once much more widespread.

Scribonius Largus (*fl.* A.D. 47) was one of the earliest medical writers to discuss Queen Anne's lace, including it in a recipe designed to induce an abortion.[85] Other ancient writers, such as Galen and Paul of Aegina, also recommended its anti-fertility properties.[86] The Middle Ages learned of its qualities not only

---

[82] Langham, *Garden of Health*, p. 210.

[83] Farnsworth *et al.*, "New Antifertility Agents: I", p. 549.

[84] Personal interview with Mary Reichle, public health nurse in Watauga County, North Carolina, Aug. 1990.

[85] Scribonius Largus, *Compositiones*, 121 (ed. Sergio Sconocchia, Teubner., Leipzig, 1983, p. 64). Technically the Latin says "after an abortion" (*ex parte abortuve*), but since almost all the recipe's sixteen ingredients (including myrrh, asarum, opopanax and Queen Anne's lace) are abortifacients, I am assuming that either Scribonius simply misunderstood what the women were telling him (or his source) or else that the women misinformed him. There would be no medical grounds for taking the mixture after an abortion, and indeed many good reasons for not doing so!

[86] As an emmenagogue, see Galen, *De simplicium medicamentorum*, vi.4.2-3 (ed. Kühn, xi, pp. 862-3); as an abortifacient, a related species, the death carrot (*thlapsi*), see *ibid.*, vi.8.5 (xi, pp. 886-7). Paul of Aegina, *Epitomae medicae*, iii.61.5.26-8 (ed. Heilberg, i, p. 276), discusses its seeds as emmenagogues, and, in the pharmacy section, gives two listings, *daucus* and *staphulinos*, which are both carrots, and which

(cont. on p. 22)

through classical texts, but also from contemporary writings. For instance, Constantine the African spoke of its very strong emmenagogic qualities: it exhibited the third degree of intensity.[87] In a late Salernitan work dating from the second half of the thirteenth century, Petrus Marancius listed Queen Anne's lace as an emmenagogue, but did not include it among abortifacients.[88]

Queen Anne's lace in fact inhibits implantation. An extract of its seeds exhibits oestrogenic activity, meaning that it is a contraceptive.[89] Following up the observation that rural populations in Rajasthan in India chewed the dried seeds of Queen Anne's lace to reduce fertility, an experiment revealed that dosages varying from 80 mg. to 120 mg. administered to mice between the fourth and sixth days of pregnancy reduced implantation by 100 per cent.[90] Another study shows that seeds from Queen Anne's lace inhibit "implantation, ovarian growth . . . [and disrupt the] estrous cycle".[91] A recent Chinese laboratory test "clearly" suggests that the seed terpenoids block progesterone synthesis in pregnant animals.[92] The drug is judged to have promise as a postcoital anti-fertility agent.[93]

8) *Medieval Contributions to Birth-Control Knowledge*

Medieval scribes modified classical texts to include anti-fertility information that the classical authorities ought to have mentioned,

---

(n. 86 cont.)
modern authorities consider to be the same plant, *Daucus carrota*: *ibid.*, vii.3, s.v. *daucus*, *staphulinos*.

[87] Constantine the African, *De gradibus*: Bayerische Staatsbibliotheck, MS. lat. 267, c. xiv, fo. 123.

[88] Petrus Marancius, *Tabulae*, ed. Salvatore de Renzi, in *Collectio Salernitana*, 5 vols. (Bologna, 1852), iv, pp. 564-5.

[89] Farnsworth *et al.*, "New Antifertility Agents: I", p. 554; V. P. Kamboj and B. N. Dhawan, "Research on Plants for Fertility Regulation in India", *Jl. Ethnopharmacology*, vi (1982), p. 207; S. K. Garg and G. P. Garg, "Antifertility Screening of Plants, Part VII: Effect of Five Indigenous Plants on Early Pregnancy in Albino Rats", *Indian Jl. Medical Research*, lix (1970), pp. 302-6.

[90] M. M. Sharma, Gopal Lal and Dennis Jacob, "Estrogenic and Pregnancy Interceptory Effects of Carrot *Daucus Carota* Seeds", *Indian Jl. Experimental Biology*, xiv (1976), pp. 506-8. From the eighth to the tenth day, however, implantation was not prevented in 61 per cent of the animals. Nevertheless the results show that, as the early sources indicated, the plant is an effective post-coital anti-fertility agent.

[91] B. B. Kaliwal, R. Nazeer Ahamed and M. Appaswamy Rao, "Abortifacient Effect of Carrot Seed (*Daucus Carota*) Extract and its Reversal by Progesterone in Albino Rats", *Comp. Physiology and Ecology*, ix (1984), pp. 70-4.

[92] Kong, Xie and But, "Fertility Regulating Agents", pp. 18-19.

[93] Ashwini Kant, Dennis Jacob and N. K. Lohiya, "The Oestrogenic Efficacy of Carrot (Daucus carota) Seeds", *Jl. Advanced Zoology*, vii (1986), pp. 36-41.

but had not included in their treatises. Inexplicably, Dioscorides had failed to discuss rue's anti-fertility properties, so a medieval scribe in or before the fourteenth century added the phrase: "it discharges the menses and aborts the foetus/embryo".[94] Writing between 1307 and 1311, Peter of Padua added a gloss beside the entry for *asarus* in the Latin text of the Alphabetical Dioscorides. The note comments that it was taken by uninformed people before coitus.[95] Like rue, asarum (*Asarum europaeum* L.) is an anti-fertility agent.[96]

Tansy (*Tanacetum vulgare* L.) is a plant familiar to us, but although it must also have been familiar to the Greeks and Romans there is no word for it in either of their languages. Throughout antiquity tansy wasted its blooms on poets and herbalists who failed to mention it in surviving documents. Presumably for the ancients it had no use, and hence no name. In contrast, Hildegarde of Bingen (1098-1179), abbess of her convent, prescribes tansy as an emmenagogue.[97] Today, tansy is a well-known abortifacient of the ecbolic kind.[98] Tansy is just one example of many contraceptives and abortifacients of which the knowledge is first recorded in the medieval West. Even excluding emmenagogues and abortifacients, Peter of Spain (1226-77), in his *Drugs for Poor People* (*Thesaurus pauperum*), offered 116 prescriptions related to fertility and sexuality: 34 for aphrodisiacs, 26 for contraception and 56 to enhance fertility. Peter was the future Pope John XXI. As Danielle Jacquart and Claude Thomasset observed, it is paradoxical that at a time when the church's stand against abortion and contraception was strong, knowledge of agents capable of acting in this way appears to have been widespread.[99] Albertus Magnus exemplifies the paradox: in his writings on medical lapidaries, Albertus included specific birth-control prescriptions, while at the same time speaking out against birth-control in his theological works.[100]

---

[94] "Kinei dē kai katamēnia, ta de embrua phtheirei": scholia to Dioscorides, *De materia medica*, iii.45 (ed. Wellmann, ii, p. 59); in a fourteenth-century manuscript: Vatican Lib., MS. Palat. 77.

[95] Gloss by Peter of Padua, printed in the Latin Alphabetical Dioscorides published at Colle in 1478, s.v. *asarus*: "The herb asarum . . . which is taken by rustic people before coitus" (*herba ab asaro . . . quem autem sit ante coitum viri ignorari*). There are two entries on asarum in the edition glossed by Peter.

[96] V. J. Brøndegaard, "Contraceptive Plant Drugs", *Planta medica*, xxiii (1973), p. 168.

[97] St. Hildegarde, *Physica*, 111 (ed. Charles Daremberg, Patrologiae cursus completus, ser. ed. J.-P. Migne, ser. lat., cxcvii, Paris, 1855, col. 1174): *reynfan = tanacetum*. The editor has bracketed the passage and raises the possibility of an interpolation, which, in any case, would indicate a medieval discovery. Hildegarde discussed other abortifacient drugs.

[98] Arthur Osol *et al.*, *Dispensatory of the United States of America*, 25th edn. (Philadelphia, 1955), p. 1896; *Taber's Cyclopedic Medical Dictionary*, 6th edn. (Philadelphia, 1954), s.v. ecbolic. A recent report on the use of tansy as an emmenagogue and abortifacient in folk medicine can be found in Conway and Slocum, "Plants Used as Abortifacients and Emmenagogues", p. 257.

III

BIRTH-CONTROL: THE SOCIOLOGY OF A KNOWLEDGE

The extent to which women throughout history have known about birth-control is an important but ultimately unanswerable question. Evidence such as that presented here nevertheless makes it reasonable to attribute some knowledge to women. In cases such as Queen Anne's lace, it is equally important to discover why so few women today know what must once have been known by many. In tackling the question of the acquisition of knowledge — of how our ancestors discovered that certain plants affected fertility — we may, however, uncover clues to the answer to the first two questions.

The death carrot (*thlapsi* = *Thlapsia garganica* L.) is related to the wild carrot (Queen Anne's lace) — both are umbellifers — and may have occasionally been confused with it. A drug extracted from the root of the death carrot was given to induce abortions, but, possibly on account of its strength, many ancient physicians omitted it from their list of suitable drugs.[101] The great French botanist, Joseph Pitton de Tournefourt (1656-1708), recorded that he had observed an "old woman doctoress in Salamanca" who administered the death carrot to patients "to bring down the terms", but that the practice was "in great hazard of their lives".[102] How had she acquired this knowledge?

---

[99] Danielle Jacquart and Claude Thomasset, *Sexualité et savoir médical au môyen age* (Paris, 1985), pp. 126-8 (trans. by Matthew Adamson as *Sexuality and Medicine in the Middle Ages*, Princeton, 1989).

[100] Albertus, *De mineralibus*, ii.2.8, 13 (ed. Auguste Borgnet, *B. Alberti Magni opera omnia*, 38 vols., Paris, 1890-9, v, pp. 39b, 43a); see also John M. Riddle and James Mulholland, "Albert on Stones and Minerals", in *Albertus Magnus and the Sciences* (Toronto, 1980), p. 209; Pamela M. Huby, "Soul, Life, Sense, Intellect: Some Thirteenth-Century Problems", in G. R. Dunstan (ed.), *The Human Embryo: Aristotle and the Arabic and European Traditions* (Exeter, 1990), pp. 115-18.

[101] According to Pliny, *Natural History*, xiii.43.125-6 (possibly *T. arvense* L.); but Dioscorides, *De materia medica*, iv.153, showed no reluctance to relate medicinal usages for the plant.

[102] J. P. de Tournefort, *The Compleat Herbal*, 2 vols. (London, 1719), ii, p. 149.

Discussing this very plant, Theophrastus (d. *c.* 287 B.C.) observed that "The cattle of the country [Attica] do not touch it, but imported cattle feed on it and perish of diarrhoea".[103] Even though Theophrastus did not specifically point to an anti-fertility effect, we can speculate that some people observing the behaviour of cattle were encouraged to experiment. Whether it was during Theophrastus' time, later or before, the historian can probably never know. All we can say with confidence is that by the first century A.D. death carrot was being prescribed as an anti-fertility agent, and that the knowledge that it possessed this quality was not arrived at in the research laboratory of a learned physician. It was learned physicians, however, who acknowledged its effectiveness and recorded it. The woman in Salamanca had probably acquired her knowledge of its properties through a combination of written and oral communication.

In his study of the history of contraception, written in 1936, Norman Himes concluded that oral contraceptives ("potions") in use during the classical period were ineffective and, secondly, that knowledge of the few other contraceptive devices that worked, specifically vaginal suppositories, would have been "confined largely to the heads of medical encyclopedists, to a few physicians and scholars".[104] Recent scholarly opinion on the history of birth-control can be traced back to Himes's study, which was tellingly entitled *Medical History of Contraception.* Himes failed to ask how this élite would have known in the first place what to prescribe for what, if not through the intelligent and critical observation of folk practice that was itself both intelligent and discerning.

The fourth-century Greek physician Oribasius listed as anti-fertility drugs "beaten wormwood, pennyroyal, century plant, thyme, rue *and others which have those qualities*".[105] Clearly he thought that his readers already knew the list. Moreover — as I will demonstrate elsewhere — the substances were pharmaceutically active as he presented them.[106] Similarly, a treatise attributed to Constantine the African, *On Sexual Intercourse*, contains no discussion of contraceptives and abortifacients apart from the intriguing statement that there are medicines "that impede and prohibit the semen and dry it out . . . [There are] cold nutriments that suppress the libido, [and] they are lettuce, purslane, cucumber, beets, mulberry, gourd and melons. There are in truth things that do not generate semen but dry it out and dissipate it on account of heat and dryness, and they are *dill, rue, and similar things*".[107]

---

[103] Theophrastus, *De historia et causis plantarum*, ix.20.3 (ed. and trans. Hort, ii, p. 306).

[104] Himes, *Medical History of Contraception*, p. 100.

[105] Oribasius, *Collectiones medicae*, 2 (ed. Mørland, *Oribasius Latinus*, p. 148).

[106] Riddle, *History of Oral Contraceptives.*

There is even some evidence that ancient physicians, all those cited thus far being male, did not fully understand the procedures for taking the anti-fertility agents. In no account, medical or non-medical, is there sufficient detail to permit efficient administration. Medical writers did not normally write in modern "handbook" style. The sixth-century medical writer Aetius of Amida gave this "liquid prescription that prevents pregnancy" (*Pinomenos de kōluei tēn sullēpsin*): "take Cyreniac juice [from *Ferula historica*], opopanax [*Ferula opopanax* Spr.] and rue in equal parts. Prepare by bruising leaves and soaking, and drink the amount of a bean in a mixture of wine and water".[108]

The amount recommended by Aetius at first seems too small to be effective, but the combination of the three anti-fertility plants would indeed have an effect, assuming that the calculation of the amount was within the correct margins, and that the harvesting and preparation were done properly. But as suggested, this sort of information is difficult to find in the medical documents as we have them. Doubtless — because it is difficult otherwise to understand how they could have discovered it — writers such as Aetius relied on what women had told them about amounts, preparations and frequencies. Quantities are rarely specified in the medical writings. The preparation and use of many, perhaps most, of the plant drugs required a large amount of knowledge derived from experience: among the critical factors are the morphological site of extraction, the means of extraction, the type of soil and weather conditions which the plant requires, the time to harvest it, and the amounts and frequencies of administration.[109] Thus knowledge of anti-fertility plants, and how and when to take them, appears from the evidence — scant though it is — to belong to a female culture. Some of the medicinal plants were also salad plants. The implication, as illustrated by the remarks quoted above from Pliny and Gargilius Martialis,[110] is that women were eating plants, such as rue and dill, from the same bowl as men who may not even have been aware of what was going on. One must suppose that the women knew what to eat, when and how often, and they would appear not to have learned this through books.

---

[107] Constantine the African, *De coitus liber*, in *Constantini Africani opera*, p. 305.

[108] Aetius of Amida, *Iatricorum*, xvi.17 (ed. Zervòs, p. 19). Even though the various prescriptions' ingredients (related on pp. 18-19) are the same as those related by Soranus (*Gynaecology*, i.63), the extra detail would indicate that Soranus was not Aetius' only source.

[109] John M. Riddle, *Dioscorides on Pharmacy and Medicine* (Austin, 1985), pp. xx-xxv *passim*.

The transmission of such experience would have been most efficient in cultures where the practice of birth-control was acceptable, and would have been more difficult where there was strong cultural and religious resistance. Equally important, when women wanted to be fruitful and did not desire to limit pregnancies, there would understandably be a loss in folk knowledge about the drugs which was the cumulative experience of hundreds of generations.

Obviously the ancients had no controlled laboratory and scientific methodology. They learned through observation of what worked for them and, to some degree, for animals. This type of observation, if rigorously practised, can be a science. Neither the Hippocratic physicians, Soranus, Dioscorides or Galen, nor the hundreds of writers in the Middle Ages who discussed oral and suppository contraceptives, abortifacients and emmenagogues, had themselves made many or perhaps any of the discoveries.[111] In the first century, Dioscorides wrote that the leaves of the white willow tree (*Salix alba* L.) caused "inconception" (*asullemphia*).[112] As we have seen, the first modern scientific study to claim that plant substances have anti-fertility properties, by Skarzynski, concerned the willow; and, in the same year (1933), Butenandt and Jacobi disclosed their findings about the pomegranate. Although I cannot be certain, it seems unlikely to have been sheer coincidence that led modern science initially to select for testing the same plants as were employed in ancient medicine. There may be a connection between what ancient and medieval physicians recorded about folk medicine and what has been rediscovered in recent decades.

---

[110] See above, pp. 15–16.

[111] John M. Riddle, "Folk Tradition and Folk Medicine: Recognition of Drugs in Classical Antiquity", in John Scarborough (ed.), *Folklore and Folk Medicines* (Madison, 1987), pp. 33-61.

[112] Dioscorides, *De materia medica*, i.104.1.4-5.

IV

CONCLUSIONS

From classical antiquity onwards, we know that some form of birth-control has been practised. Some of the ancients, such as Plato, Aristotle and Polybius, specifically stated that there were ways to control population, but failed to specify the means.[113] In addition, the occasional efforts of the Roman government to increase the birth-rate (or at least the rearing of children) testify that governmental leaders thought that the raising of children needed encouragement and that the issue could be addressed.[114] Musonius Rufus attributed the low birth-rate during Augustus' reign to contraception and abortion.[115] In the second century, Juvenal remarked that "we've so many sure-fire drugs (*medicamina*) for inducing sterility (*steriles facit*)".[116] Similarly, in the medieval period, there are numerous religious, legal and other sources which indicate that contraceptives were not only known, but generally severely discouraged,[117] such as the eighth-century penetential which enquires whether a woman had used a contraceptive.[118]

---

[113] Plato, *Laws*, v.740.D (ed. R. G. Bury, 2 vols., Cambridge, Mass., and London, 1952, ii, p. 366); Aristotle, *Politics*, vii.14.10 (1335b, ll. 19-26) (ed. H. Rackham, Cambridge, Mass., and London, 1927, pp. 622-4); Polybius, *Histories*, xxxvi.17.5-12 (ed. W. R. Paton, 6 vols., Cambridge, Mass., and London, 1960, vi, pp. 382-4).

[114] The Augustan legislation to increase fertility of 18 B.C. (*Lex Julia de maritandis ordinibus*) and A.D. 9 (*Lex Papia Poppaea*) was followed by the Alimentary Laws that periodically provided, when resources were available between the first and third centuries A.D., cash payments to parents to raise children. See Richard Duncan-Jones, *The Economy of the Roman Empire: Quantative Studies* (Cambridge, 1974), pp. 291-310. Josiah Cox Russell, *The Control of Late Ancient and Medieval Population* (Philadelphia, 1985), pp. 101-76, speaks of the first millennium A.D. as being a period of "population stability". In the second century B.C., Polybius bemoaned a population decline in Greece: Polybius, *Histories*, xxxvi.17.5-12 (ed. Paton, vi, pp. 383-5).

[115] Musonius, frag. 15a (ed. O. Hense, *Musonii Rufi reliquae*, Leipzig, 1905, p. 77); Keith Hopkins, "A Textual Emendation in a Fragment of Musonius Rufus", *Classical Quart.*, xv (1965), pp. 72-4.

[116] Juvenal, *Satires*, vi.595 (trans. Peter Green, *The Sixteen Satires*, Harmondsworth, 1967, p. 149).

[117] John T. Noonan Jr., *Contraception: A History of its Treatment by the Catholic Theologians and Canonists*, enlarged edn. (Cambridge, Mass., 1986), *passim*; additional evidence was gathered by Jean-Louis Flandrin, "Contraception, marriage et relations amoureuses dans l'occident chrétien", *Annales E.S.C.*, xxiv (1969), pp. 1370-90; B. D. H. Miller, "'She Who Hath Drunk Any Potion'", *Medium aevum*, xxxi (1962), pp. 188-95.

[118] Pseudo-Bede, *The Order for Giving Penance*, 30; trans. in Noonan, *Contraception*, p. 156: "Have you drunk any *maleficium*, that is, herbs or other agents so that you could not have children?". Noonan believes that *maleficium* meant a sterilizing drink and probably a contraceptive. *Maleficia* were used with and could apparently be interchanged with *steriles*.

In the introduction we noted that modern scholars have disregarded the testimony of our ancestors concerning oral contraceptives.[119] Confronted with the demographic data, they turn to infanticide[120] and, more recently and related to infanticide, child abandonment,[121] as the factors that supply the best explanation. In contrast, John Noonan, a Catholic canonist and historian, without citing either medical or scientific evidence in support of his case, has argued that the contraceptives must have had some positive effect simply on the basis of their persistence in historical records over long periods of time. More recently David Herlihy has tentatively suggested that some form of effective contraception was used in late medieval Tuscan marriages, on the grounds that married women during the height of their fertile periods had fewer children than expected.[122] This medieval evidence accords with the result of a comparison between paleopathological data from the prehistoric Mediterranean region and preliminary findings from the first century A.D. Studies based on burials at Lerna indicate that forty-seven women (*c.* 1750 B.C.) allegedly averaged five births each, while at Karatas (*c.* 2400 B.C.) 164 women averaged four births.[123] These relatively high numbers contrast sharply with a study of the women who died in A.D. 79 at Herculaneum, who averaged only 1.81 births each.[124] This evidence is not as "hard" as it appears, because there is some question whether the number of times a woman gave birth can be so precisely and consistently revealed through the count of lesions (dorsal pits) near the symphyseal border on female pubes indicating the number of parturitions.[125] The fact that the women at Herculaneum all died at the same time, some without having experienced a full life of pregnancy vulnerability, needs also to be taken into account.[126] Just the same, when taken with the other material, such as demographic, medical, legal, theological and other literary records, the evidence is against infanticide as the primary factor influencing demographic data, because of the paucity of evidence attesting its widespread usage. If there is so little evidence for infanticide, it is unlikely that it was very common. On the other hand, there is abundant testimony to chemical birth-control measures.

---

[119] See esp. Himes, *Medical History of Contraception*, p. 97; Hopkins, "Contraception in the Roman Empire"; J. Knodel and E. van de Walle, "Lessons from the Past: Policy Implications of Historical Fertility Studies", *Population and Development Rev.*, v (1979), p. 227; Ariès, *Histoire des populations françaises*, pp. 494-8, 514-21; P. A. Brunt, *Italian Manpower — 225 B.C.-A.D. 14* (Oxford, 1971), p. 147. For an exception, see McLaren, *Reproductive Rituals*, p. 75: "The efficacy of these contraceptive drugs cannot, however, be totally dismissed".

[120] For the medieval period, → P. P. A. Biller, "Birth-Control in the West in the Thirteenth and Early Fourteenth Centuries", *Past and Present*, no. 94 (Feb. 1982), pp. 3-26. During classical antiquity the practice of infanticide — at least on a statistically significant scale — is contested by Donald Engels, "The Problem of Female Infanticide in the Greco-Roman World", *Classical Philology*, lxxv (1980), pp. 112-20; he defends his own position in Donald Engels, "The Use of Historical Demography in Ancient History", *Classical Quart.*, xxxiv (1984), pp. 386-93. For the claim that the evidence for infanticide is sufficiently strong to explain the (rather limited) data, see William Harris, "The Theoretical Possibility of Extensive Infanticide in the Graeco-Roman World", *Classical Quart.*, xxxii (1982), pp. 114-16. For support for Harris's case — at least for classical Athens — see Richard Feen, "Abortion and Exposure in Ancient Greece: Assessing the Status of the Fetus and 'Newborn' from Classical Sources", in William B. Bondeson *et al.* (eds.), *Abortion and the Status of the Fetus* (Dordrecht, 1983), pp. 283-300; Sarah B. Pomeroy, "The Family in Classical and Hellenistic Greece", *Trends in Hist.*, iii (1985), p. 25. See also the survey by William L. Langer, "Infanticide: A Historical Survey", *Hist. Childhood Quart.*, i (1974), pp. 353-65; Ruth Oldenziel, "The Historiography of Infanticide in Antiquity", in J. Blok and P. Mason (eds.), *Sexual Asymmetry: Studies in Ancient Society* (Amsterdam, 1987), pp. 87-107. Those who argue that there was extensive infanticide point to the male/female ratio in the population, which seems to have been higher than that we would expect biologically: see Vern Bullough and C. Campbell, "Female Longevity and Diet in the Middle Ages", *Speculum*, lv (1980), pp. 317-25. In a study conducted in rural areas in Bangladesh, the high ratio of males to females is attributed to high female mortality after the neo-natal period, which probably reflects sex-biased health- and nutrition-related behaviour: see Lincoln C. Chen, Emdadul Huq and Stan D'Souze, "Sex Bias in the Family Allocation of Food and Health Care in Rural Bangladesh", *Population and Development Rev.*, vii (1981), pp. 55-70. This suggests to me that, were there to have been a high male-to-female ratio in classical antiquity, differentials in care are a better explanation than infanticide. I advance this hypothesis mindful of Donald Engels' lament ("Use of Historical Demography", p. 390) that comparing the classical world with modern studies, such as that of Bangladesh, "is fast becoming a nuisance in the writing of classical social and economic history".

[121] John Boswell, *The Kindness of Strangers: The Abandonment of Children in Western Europe from Late Antiquity to the Renaissance* (New York, 1988).

---

[122] David Herlihy, *Medieval Households* (Cambridge, Mass., 1985), pp. 146-9.

[123] J. Lawrence Angel, "The Bases of Paleodemography", *Amer. Jl. Physical Anthropol.*, new ser., xxx (1969), p. 433.

[124] The data are forthcoming in S. Bisel's study of the skeletons of women who died at Herculaneum, described by Ann Hanson, "Greco-Roman Gynecology", *Soc. for Ancient Medicine and Pharmacy Newsletter*, xvii (1989), p. 89.

[125] D. Gentry Steele and Claud A. Bramblett, *The Anatomy and Biology of the Human Skeleton* (College Station, Texas, 1988), pp. 202-4. One study has found that while there is a statistical association between the number of marks or lesions and full-term pregnancies, the "correlation is not strong": Judy Myers Suchey *et al.*, "Analysis of Dorsal Pitting in the *Os Pubis* in an Extensive Sample of Modern American Females", *Amer. Jl. Physical Anthropol.*, new ser., li (1979), pp. 517-40. Another study concludes that the parturition number cannot be more precisely stated than as indicating those women who had full-term pregnancies and those who did not: Marc A. Kelley, "Parturition and Pelvic Changes", *Amer. Jl. Physical Anthropol.*, new ser., li (1979), pp. 541-5.

[126] J. Lawrence Angel's studies show that during the earlier classical age of Greece women averaged 4.3 births. Based on the typical age at marriage (14-15) and the fact that the skeletal remains indicate an average of lifespan of 36.2 years, one might expect each woman to have had five or six children. See Sarah B. Pomeroy, *Goddesses, Whores, Wives, and Slaves* (New York, 1975), p. 68. In comparison, the average number of children born to married women in France between 1550 and 1599 was 6.53: see Barbara A. Hanawalt, *The Ties that Bound* (Oxford, 1986), p. 217.

Were contraceptives and early-term abortifacients a significant part of birth-control? Can such birth-control account for the indications of planned parenthood in fifteenth-century Florence, or the low fertility of first-century Romans, or of the inhabitants of fifth-century Constantinople? A series of anthropological-historical studies from Nigeria, China, Korea, the Soviet Union, Haiti, New Mexico, Paraguay, Egypt, Malaysia and India reveal that present-day traditional societies employ a variety of anti-fertility agents.[127] If modern populations can regulate their fertility by plant drugs, surely so could pre-modern societies, as there is strong evidence that similar methods and agents were being used.[128]

The findings of modern medical science and anthropology enable us to believe the testimony of historical documents concerning the use of plant substances for birth-control. Right up to the twentieth century women have held that they had a right to take contraceptive and menstrual regulators, even when it aborted pregnancy, provided it was before the foetus moved or quickened.[129] What they did — as they tell us — was to take drugs and to be as careful as possible. Since we are willing to trust in the reliability of their testimony concerning the caution, we should be equally willing to do so when it comes to the drug-taking.

---

[127] For Nigeria, see D. D. O. Oylebola, "Yoruba Traditional Healers' Knowledge of Contraception, Abortion, and Infertility", *East African Medical Jl.*, lviii (1981), pp. 777-84; for China, Kong, Xie and But, "Fertility Regulating Agents", pp. 1-44; for Korea, J. O. Kokwaro, "A Review of Research on Plants for Fertility Regulation", *Korean Jl. Pharmacognosy*, xii (1981), pp. 149-52; for the Soviet Union, V. V. Kharkhov and M. N. Mats, "Pasteniia kak potentsial'nye istochniki protivozachatochnhkh sredstv" [Plants as a Potential Source of Contraceptive Drugs], *Rastite'nye Resursy*, xvii (1981), pp. 293-9; for Haiti, B. Weniger, H. Haag-Berrurier and R. Anton, "Plants of Haiti Used as Antifertility Agents", *Jl. Ethnopharmacology*, vi (1982), pp. 67-84; for New Mexico, Conway and Slocumb, "Plants Used as Abortifacients and Emmenagogues", pp. 241-61; for Paraguay, P. Arenas and R. Moreno Azorero, "Plants Used as Means of Abortion, Contraception, Sterilization and Fecundation by Paraguayan Indigenous People", *Econ. Botany*, xxxi (1977), pp. 302-6; for Egypt, K. C. Tiwari, R. Majumder and S. Bhattacharjee, "Folklore Information from Assam for Family Planning and Birth Control", *Internat. Jl. Crude Drug Research*, xx (1982), p. 133; for Malaysia, Carol Laderman, *Wives and Midwives: Childbirth and Nutrition in Rural Malaysia* (Berkeley, 1983), esp. p. 78; for India, R. C. D. Casey, "Alleged Anti-Fertility Plants of India", *Indian Jl. Medical Sciences*, xiv (1960), pp. 590-600.

[128] In an extensive recent survey of birth-control methods conducted by the World Fertility Survey (W.F.S.) and the Contraceptive Prevalence Surveys (C.P.S.), women who replied to the question about contraceptive use and said that they took herbs, were placed in the category, "Not using". The result was that as many as 93.5 per cent of the women in Bangladesh and as few as 33.2 per cent in Costa Rica were categorized as non-users of contraceptives!: John E. Anderson and John G. Cleland, "The World Fertility Survey and Contraceptive Prevalence Surveys: A Comparison of Substantive Results", *Studies in Family Planning*, xv (1984), p. 7. The blind neglect of traditional medical remedies in this survey is in stark contrast to the World Health Organization's call for the study of such medicines.

North Carolina State University *John M. Riddle*

---

[129] McLaren, *Reproductive Rituals*, p. 107.